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Patricia A. Nolan, MD, MPH, Director

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## The Impact of Poverty on Prevention Practices and Health Status among Persons with Asthma

Colleen Caron, PhD, Annie Gjelsvik, PhD, and  
Jay S. Buechner, PhD

Lifetime asthma prevalence among adults in the United States climbed to 11.7 percent in 2003. Rhode Island paralleled and surpassed this rise – 14.4 percent of adults aged 18 and older in the state have been told by a health provider they had asthma at some point in their lifetime. Within these increasing trends, a disproportionate number of individuals living in low-income households have asthma compared to individuals with higher incomes.<sup>1</sup>

Poverty has long been associated with elevated asthma prevalence, as have race, ethnicity and urban residence.<sup>2</sup> The purpose of this paper is to investigate how asthma and poverty affect quality of life among men and women, specifically how the two combine to impact primary and secondary prevention behaviors important to health in individuals with asthma and health status indicators associated with asthma.

The two primary prevention behaviors selected are smoking and physical activity. Smoking is a suggested cause of asthma and a known trigger to asthma exacerbations.<sup>3</sup> Physical activity is linked to overall improved health and disease reduction,<sup>4</sup> and sedentary lifestyle is associated with greater risk of obesity, a health status indicator related to asthma.<sup>3</sup> Also, exercise-induced asthma may lead to tendencies to avoid physical activity, further increasing the risk of obesity.

The two secondary health preventive behaviors selected are annual physician visits and annual flu shots. These behaviors are important for asthma management and reflect the National Asthma Education and Prevention Program guidelines from the National Heart, Lung, and Blood Institute.<sup>5</sup> The health status indicators selected are obesity and depression, both of which have positive associations with asthma.<sup>3</sup>

**Methods.** The Behavioral Risk Factor Surveillance System (BRFSS) is a national telephone survey of randomly selected non-institutionalized adults (ages 18 and older) who live in households with telephones. The BRFSS monitors the prevalence

of behavioral risk factors that contribute to the leading causes of disease and death among adults in the United States. It is administered in all 50 states and four U.S. territories with funding and methodological specifications provided by the Centers for Disease Control and Prevention (CDC).<sup>1</sup> Rhode Island has participated in the BRFSS since 1984; a professional survey organization conducts the annual survey under contract to the Rhode Island Department of Health. From January 2001 through December 2003, the Rhode Island BRFSS conducted approximately 330 random-digit dialed telephone interviews each month, for a total of 12,016 during the three calendar years. The sample was comprised of 4,618 males and 7,398 females.

Respondents who reported income below 200% of the federal poverty threshold<sup>6</sup> were considered poor. Three years of data were combined in order to obtain sufficient sample size for our analyses, and data for men and women were analyzed separately. The variables included in the analysis are defined as follows:

- **Lifetime asthma prevalence:** Ever told by a health professional that they have asthma
- **Poor:** Household income below 200% of the federal poverty level.<sup>6</sup>
- **Physical activity:** Any physical activity or exercise during the past month, other than job-related
- **Smoking:** Have smoked at least 100 cigarettes lifetime and now smoke cigarettes every day or some days
- **Annual physician visit:** Visited a doctor for a routine checkup within past 12 months
- **Annual flu shot:** Had a flu shot within the past 12 months
- **Obesity:** BMI greater than or equal to 30 based on self-reported height and weight
- **Depression:** Self-reported depression or poor mental health on 14 or more days in past month

All data are weighted to represent the Rhode Island adult population. 95% confidence intervals (CI) were calculated using SAS statistical software version 8.2, which accounts for the complex sampling design of the BRFSS. (A 95% confidence interval means there is a 95% likelihood that the interval includes the true value).

**Results.** During 2001-2003, 13% (95% CI: 12%-14%) of RI adults ages 18 years and older reported ever having asthma. Fifteen percent (95% CI: 14%-16%) of women and 11% (95%

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CI: 10%-12%) of men reported ever having asthma. Fifteen percent (95% CI: 13%-16%) of adults living below 200% of the federal poverty level, (“poor/poverty” in this analysis), and 12% (95% CI: 11%-13%) of adults not living in poverty reported ever having asthma. Stratified by and within gender, 17% (95% CI: 15%-19%) of females living in poverty compared to 14% (95% CI: 13%-15%) of females not living in poverty reported ever having asthma. Ten percent (95% CI: 8%-13%) of males living in poverty and 10% (95% CI: 9%-12%) of males not living in poverty reported ever having asthma.

Table 1 presents the prevalence of the six chosen measures of preventive behaviors and health status among adult Rhode Islanders, stratified by gender, poverty, and prevalence of asthma.

**Table 1.**

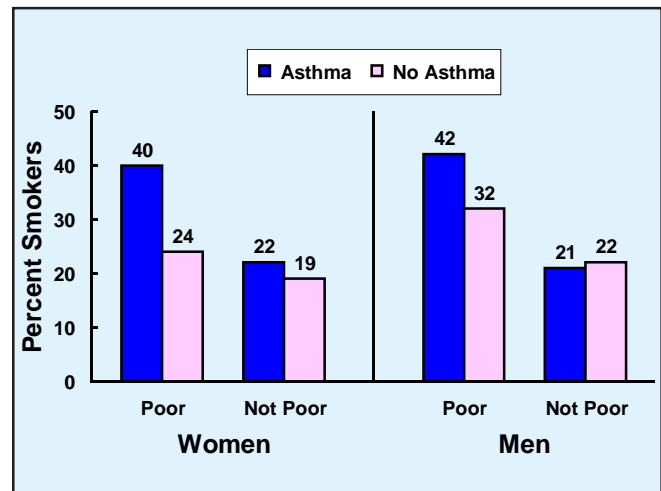
### Prevalence of Prevention Behaviors and Health Status Measures, by Gender, Income, and Asthma Status, Ages 18 and Over, Rhode Island, 2001-2003.

Measure	Women				Men			
	Poor		Not Poor		Poor		Not Poor	
	Asthma	No Asthma	Asthma	No Asthma	Asthma	No Asthma	Asthma	No Asthma
	%	%	%	%	%	%	%	%
<b>Primary Prevention Behaviors</b>								
Physical Activity	58	60	80	81	67	69	87	84
Smoking	40	24	22	19	42	32	21	22
<b>Secondary Prevention Behaviors</b>								
Annual Physician Visit	85	85	88	87	71	70	72	76
Annual Flu Shot	45	37	44	36	38	34	37	35
<b>Health Status Measures</b>								
Obesity	64	52	48	42	70	63	62	70
Depression	49	36	38	31	41	31	29	19

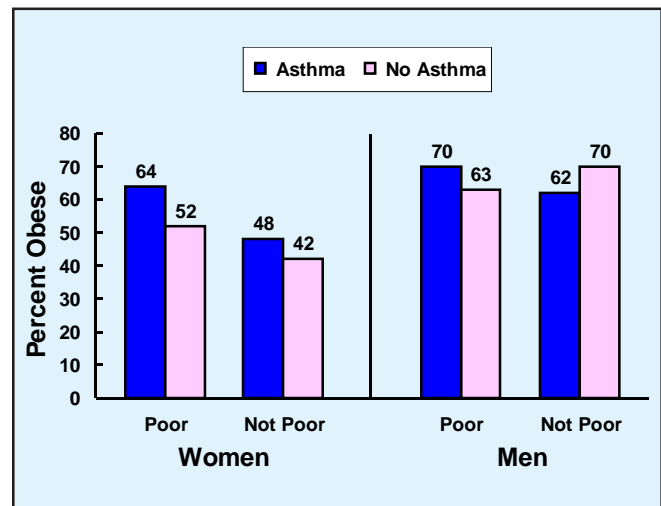
The correlation of poverty with most of these measures is clear. Those in poverty have higher prevalence of smoking, depression, and obesity (except in men) and lower prevalence of physical activity. Poverty has a smaller effect or no effect on the prevalence of the secondary prevention behaviors, annual doctor visits and annual flu shots.

Asthma is also strongly related to some of the chosen measures, notably smoking, depression, and obesity (except among men who are not poor). Asthma has a small, less significant, correlation with physical activity, and no apparent effect on the likelihood of having had a doctor visit in the past year. Individuals with asthma were more likely overall to have had an annual flu shot than those without asthma, especially among women.

The interaction between poverty and asthma was most prominent for smoking (Figure 1) and for obesity (Figure 2). In both cases the elevation in prevalence among individuals with asthma relative to individuals without asthma was greater



**Figure 1.** Smoking Prevalence, by Gender, Income, and Asthma Status, Ages 18 and Over, Rhode Island, 2001-2003.



**Figure 2.** Prevalence of Obesity, by Gender, Income, and Asthma Status, Ages 18 and Over, Rhode Island, 2001-2003.

for those in poverty, both men and women, than for those who were not poor.

**Discussion.** Women with asthma in poverty had the highest prevalence of current smoking, obesity, and depression compared to all other women. In addition, within asthma status women who were poor had a lower prevalence of physical activity compared to their counterparts who were not poor. Generally similar patterns were seen among men.

These findings are informative to the design of asthma interventions aiming to enhance primary and secondary preventive behaviors and health status outcomes. The results demonstrate the differential manifestation of the intersection between poverty and gender on asthma and its associated health actions and outcomes. These results provide additional support to the notion that health interventions can be more effective when tailored to account for the influence of the socio-economic context on health behaviors and outcomes.

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## Health by Numbers

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Colleen Caron, PhD, is Senior Epidemiologist in the Division of Disease Prevention and Control and Clinical Assistant Professor of Community Health, Brown Medical School.

Annie Gjelsvik, PhD, is Project Coordinator of the Assessment Initiative Grant and Investigator, Department of Community Health, Brown Medical School.

Jay S. Buechner, PhD, is Chief, Office of Health Statistics, and Clinical Assistant Professor of Community Health, Brown Medical School.

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Rhode Island Department of Health  
Office of Health Statistics  
3 Capitol Hill  
Providence, RI 02908

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